Using emotion as information in future-oriented cognition: Individual differences in the context of state negative affect

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ABSTRACT

Predictions about the future are susceptible to mood-congruent influences of emotional state. However, recent work suggests individuals also differ in the *degree* to which they incorporate emotion into cognition. This study examined the role of such individual differences in the context of state negative emotion. We examined whether trait tendencies to use negative or positive emotion as information affect individuals' predictions of what will happen in the future (*likelihood estimation*) and how events will feel (*affective forecasting*), and whether trait influences depend on emotional state. Participants ($N = 119$) reported on tendencies to use emotion as information ("following feelings"), underwent an emotion induction (negative versus neutral), and made likelihood estimates and affective forecasts for future events. Views of the future were predicted by both emotional state and individual differences in following feelings. Whereas following negative feelings affected most future-oriented cognition across emotional states, following positive feelings specifically buffered individuals' views of the future in the negative emotion condition, and specifically for positive future events, a category of future-event prediction especially important in psychological health. Individual differences may confer predisposition toward optimistic or pessimistic expectations of the future in the context of acute negative emotion, with implications for adaptive and maladaptive functioning.

1. Introduction

The ability to predict the future is a critical component of human cognition. People's forecasts about the future draw on memories of the past, affect their present experience, and guide decisions that can have important short- and long-term consequences, from making food choices based on predicted taste, to deciding among job offers based on predicted satisfaction (Mellers & McGraw, 2001; Wilson & Gilbert, 2003). Future-oriented cognition also plays a central role in mental health and psychological well-being. Pessimistic expectations for the future are associated with psychopathology and self-regulatory failures, from disordered eating to suicide attempts (see Marroquín, Nolen-Hoeksema, & Miranda, 2013), whereas optimistic expectations may motivate adaptive behavior in the pursuit of long-term reward (Wilson & Gilbert, 2003). Future-oriented cognition is directly influenced by state emotion, as well as by situational or contextual factors (e.g., relevance of emotion to tasks; Schwarz & Clore, 2007). However, recent work indicates that individual differences may also play an important role in whether and how present emotional experience influences one's view of the future. In the present study, we examined how individual differences in using emotion as information interact with state emotion to influence future-oriented cognition.

2. Affective influences on future-oriented cognition

Future-oriented cognition includes *likelihood estimation*, making predictions about what will happen in the future, and *affective forecasting*, making predictions about how future events will feel if they occur. Understanding affective mechanisms of future-oriented cognition is important partly because predictions guide behavior in the present (Mellers & McGraw, 2001). Moreover, future-oriented cognition depends on complex relations among cognitive and affective processes, and inaccurate predictions are commonplace. This inaccuracy can result in self-defeating behavior, such as investing cognitive resources in excessive and unproductive worry about anticipated negative outcomes (Golub, Gilbert, & Wilson, 2009). Individuals with depression and anxiety demonstrate maladaptive pessimistic views of the future, in both likelihood estimation and affective forecasting (Hoerger, Quirk, Chapman, & Duberstein, 2012; Marroquín & Nolen-Hoeksema, 2015; Miranda, Fontes, & Marroquín, 2008; Yuan & Kring, 2009).

How do such views of the future come about? Early perspectives emphasized the ways state affect influences cognitive processing in mood-congruent ways (e.g. Bower, 1981, Isen, Shalker, Clark, & Karp, 1978). Individuals in negative moods estimate negative events to be

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more likely in the future, whether negative mood is experimentally induced (e.g., DeSteno, Petty, Wegener, & Rucker, 2000) or a component of the depressive state (e.g., Marroquín & Nolen-Hoeksema, 2015). The view of the future in depressive cognition is also notable for blunted expectancies for future positive events, reflecting congruence with negative and positive affect disturbance in mood psychopathology. However, research on "affect as information" theory shows that the *extent* to which affect is incorporated into cognition depends on a number of factors (Schwarz & Clore, 1983, 2007), such as mood source, relevance, and salience. For example, directing individuals' attention to unpleasant weather decreases the influence of their mood on judgments of life satisfaction, because they construe the external source of their mood as irrelevant to such judgments (Schwarz & Clore, 1983).

Recent work also points to a potentially important role of *individual differences* in the extent to which individuals use affect as information to guide cognition and behavior. People with trait tendencies to pay close attention to their emotions are more sensitive to emotional stimuli, exhibit stronger mood effects on judgments, and make more mood-congruent likelihood estimates for future events (Gasper & Clore, 2000; Gohm, 2003). Gasper and Bramesfeld (2006) describe this individual difference as *following feelings* and have shown that people's tendencies to follow feelings are valence-specific. That is, beyond valence-general tendencies to attend to emotions more or less (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995), following negative feelings and following positive feelings are differentially associated with psychological well-being, approach and avoidance orientation, and noticing and responding to emotional stimuli in valence-specific patterns (Gasper & Bramesfeld, 2006).

Individual differences in valence-general affective traits (e.g., emotional clarity, emotional intelligence) are associated with future-oriented cognition (Dunn, Brackett, Ashton-James, Schneiderman, & Salovey, 2007; Hoerger, Chapman, Epstein, & Duberstein, 2012). However, it is unknown whether differentially following positive and negative feelings affects the view of the future, or whether trait tendencies affect future-oriented cognition over and above mood congruency. Marroquín and Nolen-Hoeksema (2015) recently demonstrated that the degrees to which individuals followed negative and positive feelings mediated the relations between depressive symptoms and pessimistic future event likelihood estimation and affective forecasting, suggesting that trait differences in following feelings may represent vulnerabilities to depressive pessimism. However, it is unclear whether this role of following feelings reveals a fundamental cognitive-affective process or is specific to depressive cognition.

In this study, we examined the extent to which following negative feelings and following positive feelings predicted likelihood estimates and affective forecasts for the future, within the context of a negative versus neutral emotional state in a nonclinical sample. We focused on effects of negative (rather than positive) emotional state for methodological and theoretical reasons. First, the majority of work on both mood congruency and affect-as-information theory has focused on negative affect; examining negative mood states allows more direct comparison of the potential role of following-feelings traits. Moreover, given the relevance of following feelings and future-oriented cognition to both adaptive and maladaptive functioning, we were interested in whether individual differences act as vulnerability or protective factors (i.e., toward pessimistic or optimistic future-oriented cognition) in the face of distress.

Our first hypothesis, consistent with a following-feelings account of future-oriented cognition, was that individuals' trait tendencies to follow negative feelings and positive feelings would be associated with, respectively, more pessimistic and more optimistic likelihood estimation and affective forecasting. Our second hypothesis, consistent with a mood congruency account, was that individuals would show more pessimistic future-oriented cognition in a negative versus neutral emotional state. Our third hypothesis tested the interplay between following

feelings and state negative emotion in future-oriented cognition. We tested two competing predictions:

(1) The pessimistic effect of following negative feelings and the optimistic effect of following positive feelings would be strongest in a negative emotional state (versus neutral). This pattern would evidence an interplay of state and trait affective characteristics such that following negative feelings confers vulnerability to negative emotion effects, and following positive feelings confers protection against them.
(2) The effects of following-feelings variables would be stronger in a neutral mood state (versus negative). This pattern would indicate that predispositions toward using emotion as information affect future-oriented cognition only when immediate negative emotional state is not in play.

3. Method

3.1. Participants and procedure

Participants were 119 undergraduates and members of the community surrounding a university in the Northeastern United States, not prescreened for any characteristic. The sample included 65 women (55%) and 54 men (45%); mean age was 19.7 years ($SD = 2.2$; range = 18–30). Self-reported ethnicity was White (56%), Asian/Asian-American (17%), Hispanic (8%), Black/African-American (8%), multi-ethnic (8%), and other (3%).[1]

The study aim was described as developing personality-based algorithms to improve movie rental website recommendations (e.g., Netflix). Participants completed baseline measures of state emotion and trait following feelings, embedded among several filler tasks about movies, actors, and rental habits, as well as questionnaires about affect, reactions to emotion, and future-oriented cognition. They were then randomly assigned to view either a negative ($n = 60$) or neutral ($n = 59$) 5-min emotion induction film, ostensibly as one of several movie clips in the study. Participants assigned to the negative emotion condition viewed an emotional scene from the movie *Stepmom* (Columbus, 1998), in which a mother with terminal cancer says goodbye to her children. This clip reliably induces sadness (Joormann, Gilbert, & Gotlib, 2010). Participants in the neutral emotion condition viewed a scene from a home improvement television show that has been shown to not elicit emotion (Curby, Johnson, & Tyson, 2012). Participants then reported on post-induction emotion and made likelihood estimates and affective forecasts for future negative and positive events. Participants were then debriefed; procedures were approved by the IRB.

3.2. Measures

3.2.1. Following feelings

Individual differences in the use of emotion as information were measured with the Following Negative Feelings and Following Positive Feelings subscales of the Following Affective States Test (FAST; Gasper & Bramesfeld, 2006). Each subscale includes 4 items (e.g., Following Negative: *I pay attention to my negative feelings*; *I always give in to my negative emotions*; Following Positive: *When I am feeling good about something, I often pursue it*; *Positive feelings give direction to life*). Item responses range from 0 (*strongly disagree*) to 6 (*strongly agree*); subscale scores are averages across constituent items. The FAST has good test–retest reliability and convergent and discriminant validity; its subscales predict attention, responsiveness to emotional stimuli, and use of affect in decision-making in valence-specific ways, and display incremental

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[1] Two additional participants were removed from the sample (prior to data analyses) because they had extreme values on future-oriented cognition variables that affected distributions.